

What Is Claimed Is:

1. A fuel injector having a piezoelectric, electrostrictive or magnetostrictive actuator (3), a valve needle (6), which is in operative connection with the actuator (3) and acted upon with a restoring force in a closing direction by a valve spring (9) to actuate a valve-closure member (7); and an hydraulic coupler (4) which encompasses a piston (25) engaging at least partially in a receiving opening (24) and forming a coupler gap (27) therewith that is filled with an hydraulic fluid,  
wherein a cavity (40) is formed in the piston (25), the cavity being open toward the coupler gap (27) and at least partially filled with the hydraulic fluid and forms a compensating chamber (42).
2. The fuel injector as recited in Claim 1,  
wherein a throttle opening (41) having a reduced flow-cross section is provided between the compensating chamber (42) and the coupler gap (27).
3. The fuel injector as recited in Claim 1,  
wherein the coupler gap (27) discharges outside the receiving opening (24) in a compensating chamber (28), which is likewise filled with hydraulic fluid and delimited by a sealing diaphragm (29).
4. The fuel injector as recited in Claim 3,  
wherein the sealing diaphragm (29) is formed by a corrugated tube.
5. The fuel injector as recited in one of the preceding claims,  
wherein a compensating piston (43) is arranged in the cavity (40).
6. The fuel injector as recited in Claim 5,  
wherein a compression spring (46) applies a force on the compensating piston (43).
7. The fuel injector as recited in Claim 5,  
wherein the compensating piston (43) is configured as differential piston (53).

8. The fuel injector as recited in Claim 7 wherein a fuel pressure is acting on the differential piston (53) on its side facing away from the compensating chamber (42).
9. The fuel injector as recited in Claim 8, wherein the differential piston (53) is additionally acted upon by the force of the compression spring (46).
10. The fuel injector as recited in Claim 8 or 9, wherein the differential piston (53) has a cylindrical nose (52) which projects into an interspace (50) filled with fuel.
11. The fuel injector as recited in Claim 10, wherein the interspace (50) is connected via a throttle line (51) to a blind hole (35) which is used to supply the fuel injector (1) with fuel.